

REMARKS

Claims 1-19 remain pending in the present application. Claims 8, 16 and 17 have been amended. Basis for the amendments can be found throughout the specification, claims and drawings as originally filed.

REJECTION UNDER 35 U.S.C. § 102

Claim 16 is rejected under 35 U.S.C. § 102(b) as being anticipated by Irvin (U.S. Pat. No. 6,029,074). Applicant respectfully traverses this rejection. Claim 16 defines, in effect, that each threshold is set to indicate a physical quantity indicative of a voice power and used to detect presence and absence of an input voice applied from a user to the mobile terminal. In addition, Claim 16 defines storing a plurality of thresholds for each of the plurality of usage conditions.

The present invention is directed to a mobile terminal having a VOX function, which reduces its power consumption when no voice is input through its microphone. Conventionally, the presence and absence of voice input is determined by comparing the input voice power with a fixed threshold power level. The input voice power varies in dependence on use conditions (hands-free, handset, etc.) of the mobile terminal. Therefore, even if the fixed threshold level is suitable to correctly determine the presence and absence of the voice input in one use condition, it is not suitable in other use conditions.

The present invention solves this drawback by detecting a use condition of a mobile terminal and selecting a threshold power level in dependence on the detected

use condition from a plurality of thresholds for that use condition, so that the presence and absence of the voice input may be correctly determined to attain the VOX function.

As discussed previously, Irvin ('074) teaches detection of use conditions and power control based on the detected use condition. Specifically, the power supplied to a transmitter 26 is lower than the level normally instructed from a base station if a mobile terminal is in a handset (hand-held) condition. On the other hand, the power is maintained at the level normally instructed from the base station if the mobile terminal is in a hands-free (cradle) condition. This power control is for reducing battery power consumption under the handset condition. The reduction of battery power consumption is not attained under the hands-free condition, because the mobile terminal is assumed to be connected to an external power source and will not run out of power. In addition, Irvin does not disclose a plurality of thresholds for each use condition as is defined in Claim 16.

Thus, Irvin only discloses the relation between the mobile terminal use condition and the power supply to the transmitter of the mobile terminal. Irvin clearly fails to teach the claimed feature of the present invention, that is, each threshold for each use condition is set to correspond to an input voice power applied to a mobile terminal (microphones 2, 3, 4 in Fig. 1), and used to detect presence and absence of a voice input.

Thus, Applicant believes Claim 16 patentably distinguishes over the art of record. Reconsideration of the rejection is respectfully requested.

REJECTION UNDER 35 U.S.C. § 103

Claims 1, 11 and 12 are rejected under 35 U.S.C. § 103(a) as being unpatentable over Irvin (U.S. Pat. No. 6,029,074) in view of Watanabe, et al. (U.S. Pat. No. 6,490,257). Claim 2 is rejected under 35 U.S.C. § 103(a) as being unpatentable over Irvin (U.S. Pat. No. 6,029,074) in view of Watanabe, et al. (U.S. Pat. No. 6,490,257) further in view of Tuoriniemi, et al. (U.S. Pat. No. 5,978,689). Claims 13-15 are rejected under 35 U.S.C. § 103(a) as being unpatentable over Irvin (U.S. Pat. No. 6,029,074) in view of Tuoriniemi, et al. (U.S. Pat. No. 5,978,689). Applicant respectfully traverses this rejection. Independent Claims 1, 11 and 13 define in effect that each threshold is set to indicate a physical quantity indicative of a voice power and used to detect presence and absence of voice input applied from a user to the mobile terminal.

The present invention is directed to a mobile terminal having a VOX function, which reduces its power consumption when no voice is input through its microphone. Conventionally, the presence and absence of voice input is determined by comparing the input voice power with a fixed threshold power level. The input voice power varies in dependence on use conditions (hands-free, handset, etc.) of the mobile terminal. Therefore, even if the fixed threshold level is suitable to correctly determine the presence and absence of the voice input in one use condition, it is not suitable in other use conditions.

The present invention solves this drawback by detecting a use condition of a mobile terminal and selecting a threshold power level in dependence on the detected use condition from a plurality of thresholds for that use condition, so that the presence and absence of the voice input may be correctly determined to attain the VOX function.

As discussed previously, Irvin ('074) teaches detection of use conditions and power control based on the detected use condition. Specifically, the power supplied to a transmitter 26 is lower than the level normally instructed from a base station if a mobile terminal is in a handset (hand-held) condition. On the other hand, the power is maintained at the level normally instructed from the base station if the mobile terminal is in a hands-free (cradle) condition. This power control is for reducing battery power consumption under the handset condition. The reduction of battery power consumption is not attained under the hands-free condition, because the mobile terminal is assumed to be connected to an external power source and will not run out of power. In addition, Irvin does not disclose a plurality of thresholds for each use condition as defined in Claims 1 and 13.

Thus, Irvin only discloses the relation between the mobile terminal use condition and the power supply to the transmitter of the mobile terminal. Irvin clearly fails to teach the claimed feature of the present invention, that is, each threshold is set to correspond to an input voice power applied to a mobile terminal (microphones 2, 3, 4 in Fig. 1), and used to detect presence and absence of a voice input.

Watanabe, et al. ('257) is cited as teaching a VOX control. However, Watanabe, et al. also fails to teach the necessity of a plurality of thresholds varying with use conditions of a mobile terminal in a VOX control. Therefore, Watanabe, et al. does not provide motivation to be applied to Irvin. Even if applied to Irvin, the combination will not provide the claimed specific combination of varying the plurality of thresholds for detecting the presence and absence of voice input in correspondence with the use condition of the mobile terminal.

Tuoriniemi, et al. ('689) is cited as teaching a handset with microphone, which is one use condition of a mobile terminal. Since Irvin fails to teach the above-amended feature, that is, the threshold is set for detecting presence and absence of the voice input and variable with the use condition of the mobile terminal, the present invention is not obvious even if Tuoriniemi, et al. is applied to Irvin.

Thus, Applicant believes independent Claims 1, 11 and 13 patentably distinguish over the art of record. Likewise, Claims 2-7, 10, 12, 14 and 15, which ultimately depend from Claims 1, 11 or 13, are also believed to patentably distinguish over the art of record. Reconsideration of the rejection is respectfully requested.

NEW CLAIM

New Claim 20 is a dependent claim depending from Claim 11 which defines the step of storing a plurality of thresholds for each microphone.

ALLOWABLE SUBJECT MATTER

Claims 8, 9 and 17 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims. Claim 8 depends from Claim 1. Claim 8 has been amended to independent form to include the limitations of Claim 1 and is thus believed to be allowable. Claim 9 depends from Claim 8.

CONCLUSION

It is believed that all of the stated grounds of rejection have been properly traversed, accommodated, or rendered moot. Applicant therefore respectfully requests that the Examiner reconsider and withdraw all presently outstanding rejections. It is believed that a full and complete response has been made to the outstanding Office Action, and as such, the present application is in condition for allowance. Thus, prompt and favorable consideration of this amendment is respectfully requested. If the Examiner believes that personal communication will expedite prosecution of this application, the Examiner is invited to telephone the undersigned at (248) 641-1600.

Respectfully submitted,

Dated: September 14, 2004

By: 

Michael J. Schmidt, 34,007

HARNESS, DICKEY & PIERCE, P.L.C.
P.O. Box 828
Bloomfield Hills, Michigan 48303
(248) 641-1600

MJS/pmg